

FIG. 1A
(PRIOR ART)

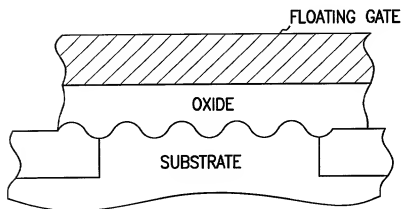


FIG. 1B
(PRIOR ART)

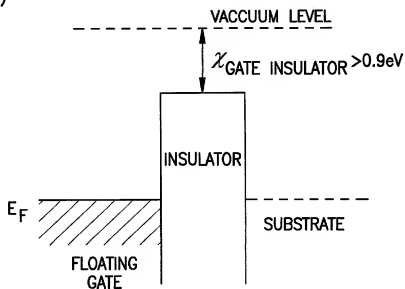


FIG. 1C
(PRIOR ART)

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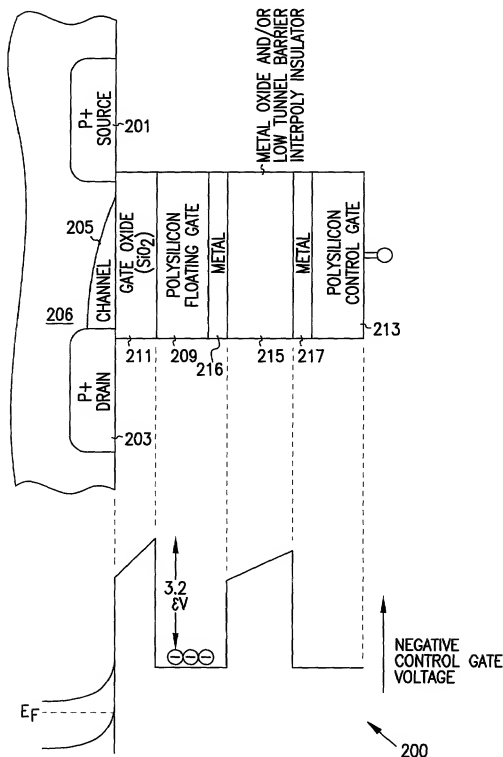
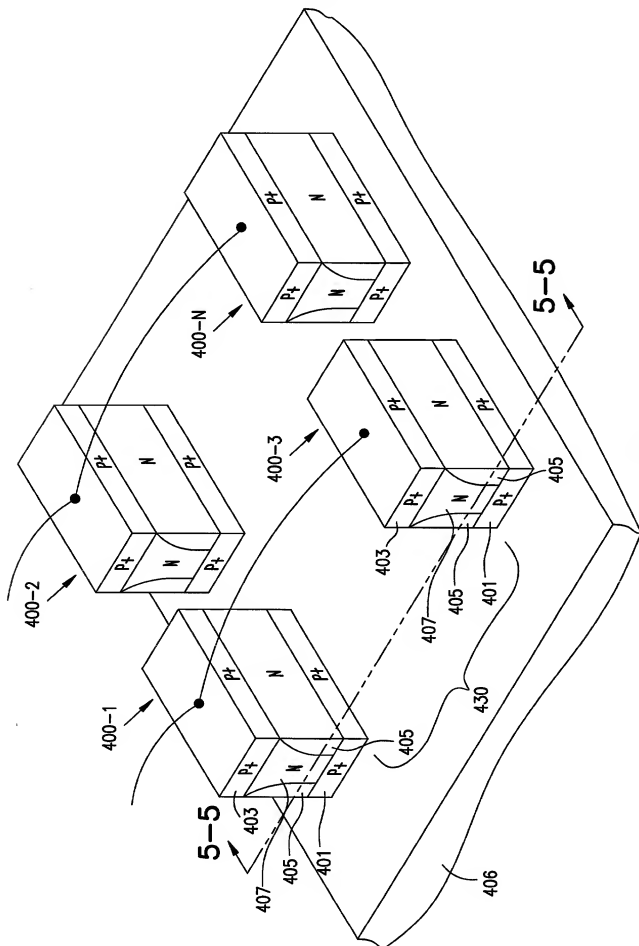


FIG. 2





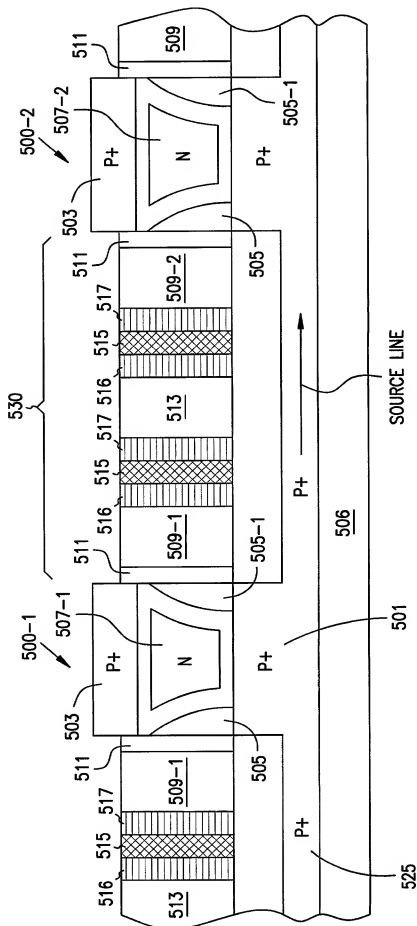


FIG. 5A

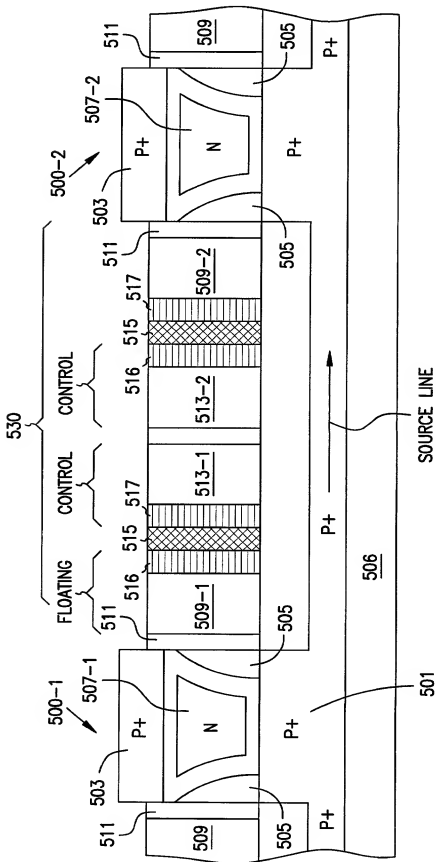


FIG. 5B

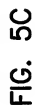


FIG. 5C

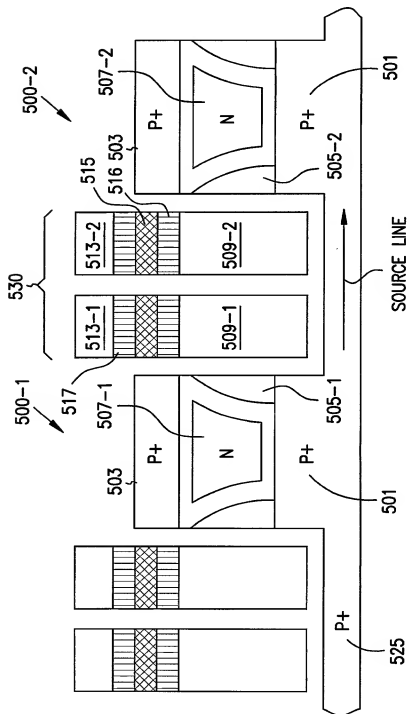


FIG. 5D

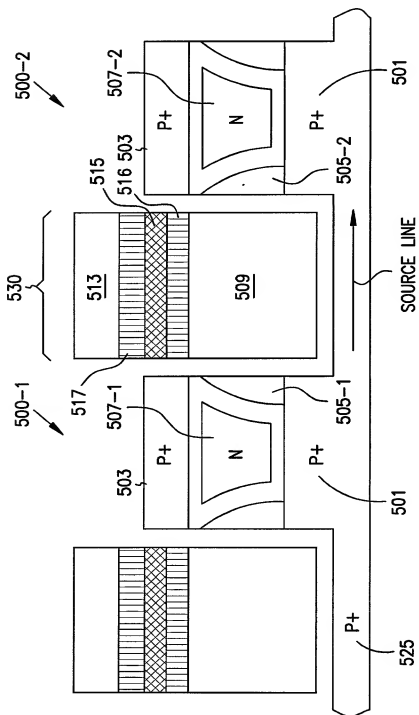


FIG. 5E

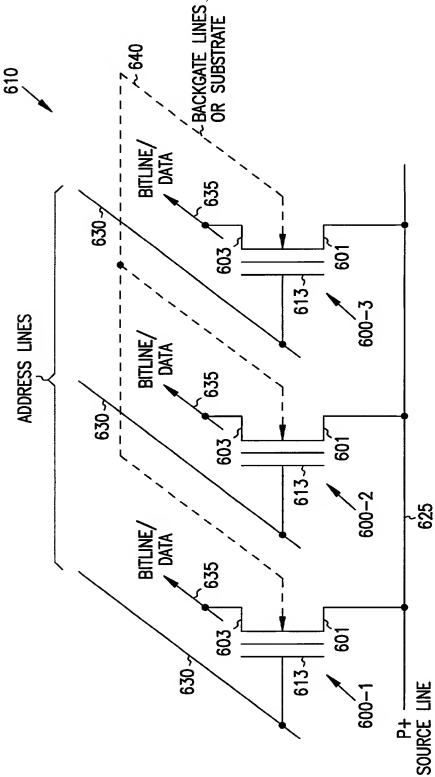


FIG. 6A

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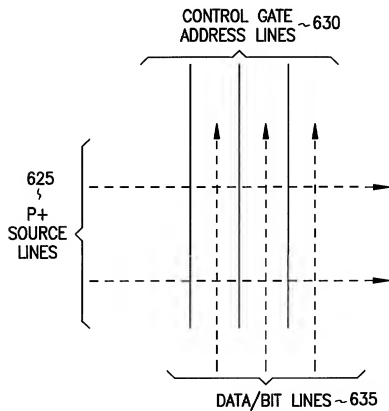


FIG. 6B

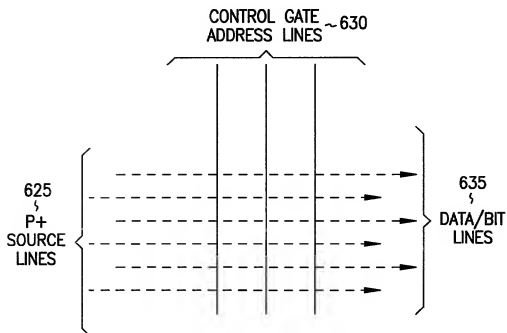


FIG. 6C

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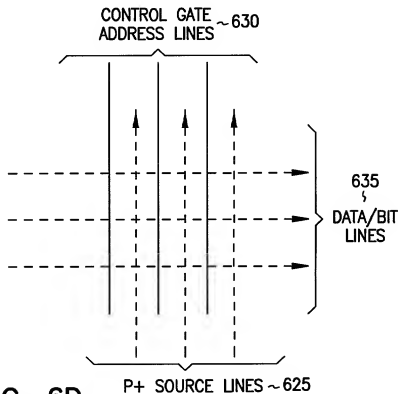


FIG. 6D

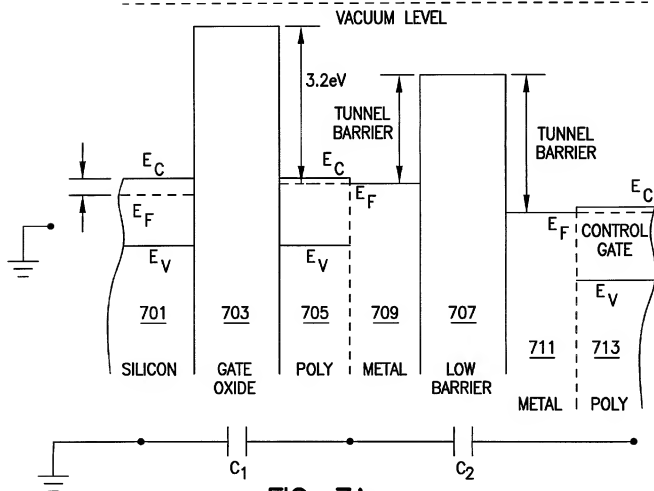
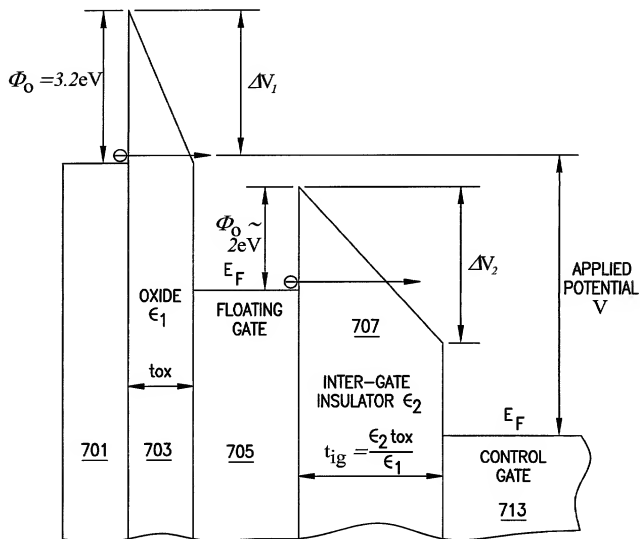


FIG. 7A

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$$J = \frac{q^2 E^2 - E_0/E}{4\pi h \Phi} e \quad E_0 = \frac{8\pi}{3} \sqrt{2mq} \Phi^{3/2}$$

FIG. 7B

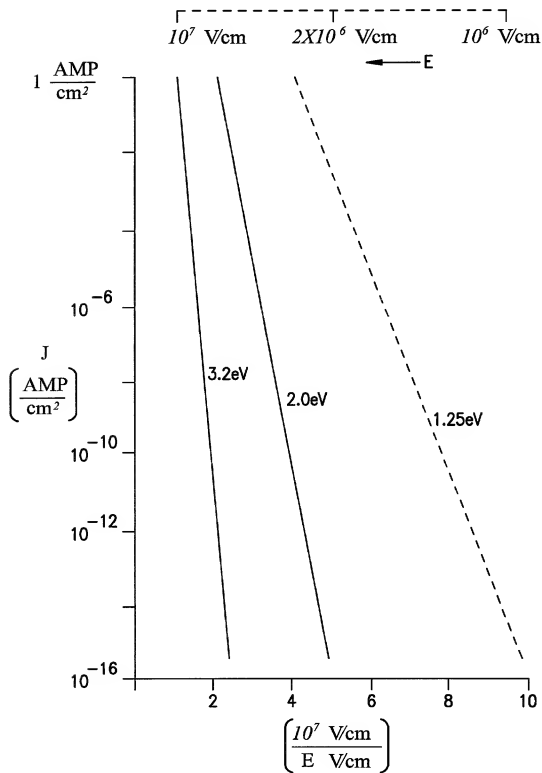


FIG. 7C

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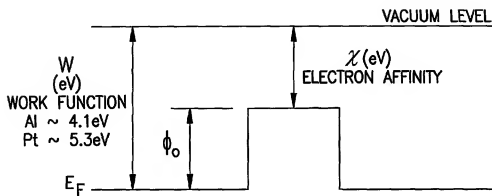


FIG. 8

	E_G	ϵ_r	ϵ_∞	χ	ϕ_0 (Pt)	ϕ_0 (Al)	ϕ_0 (Other)
<u>Conventional Insulators</u>							
SiO ₂	~ 8	4	2.25	0.9		3.2	4.0 (Si)
Si ₃ N ₄	~ 5	7.5	3.8	1.7		2.4	
<u>Metal Oxides</u>							
Al ₂ O ₃	7.6	9 - 11	3.4	2.1		~ 2	
NiO							
<u>Transition Metal Oxides</u>							
Ta ₂ O ₅	4.6 - 4.8		4.8	3.3	2.0	0.8	1.0 (Ta)
TiO ₂	6.8 80	30-	7.8	3.9	~ 1.2	0.2	0.4 (Ti)
ZrO ₂	5 - 7.8	18.5 25	4.8	2.5		1.4	2.7 (Zr)
Nb ₂ O ₅	3.1	35-50					
Y ₂ O ₃	6		4.4	1.8		2.3	1.3 (Y)
<u>Perovskite Oxides</u>							
SrBi ₂ Ta ₂ O ₃	4.1		5.3	3.3	2.0	0.8	
SrTiO ₃	3.3		6.1	3.9	1.4	0.2	
PbTiO ₃	3.4		6.25	3.5	1.8	0.6	
PbZrO ₃	3.7		4.8	3.9	~1.4	0.2	

FIG. 9

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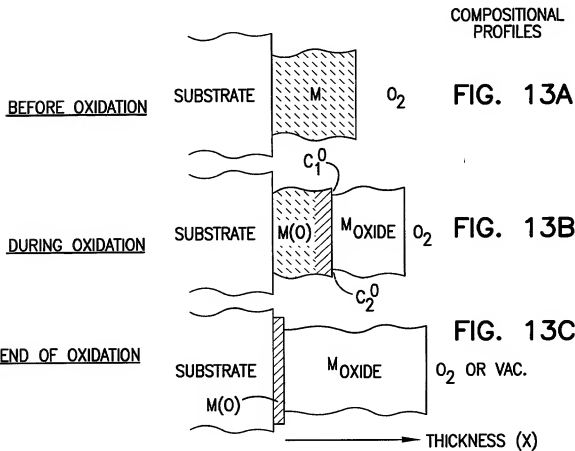
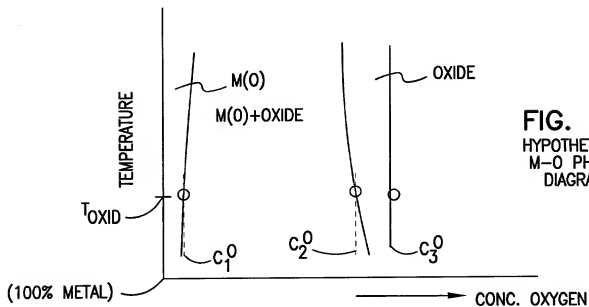
Metal	Oxygen Solub.**, at. %	Oxide Stability Range***	Semicond. Type	Structure Temp.	Transform Temp., °C
Ta	0.8	TaO ₄ 7-5.0	n	Orthorhom.	t.p. 1350
Ti	28	TiO ₃ 82-5.0	n	Rutile	m.p. 1920
Zr	29	ZrO ₃ 66-5.0	n	Monoclinic	t.p. 1170
Nb	2.3	Nb ₂ O ₄ 86-5.0	n	Monoclinic	m.p. 1495
Al	v. small	Al ₂ O ₂ 99-3.0	n	Corundum	m.p. 2050
Pb	v. small	PbO	(p)	Orthorhom.	m.p. 885
Si	v. small	SiO ₂	n or p	Tetra. (Cyst.)	m.p. 1713

FIG. 10

Metal	Orientation	Work Function, eV
Eu	Polycryst.	2.5
Sm	"	2.7
Y	"	3.1
Al	(111)	4.26
Cu	(111)	4.94
Au	(111)	5.31
Ti	Polycryst.	4.33
Rh	"	4.98
Pt	"	5.64
Zr	"	4.05
Ta	"	4.25
Nb	"	4.36
Si	(100), n-type	4.91

FIG. 11

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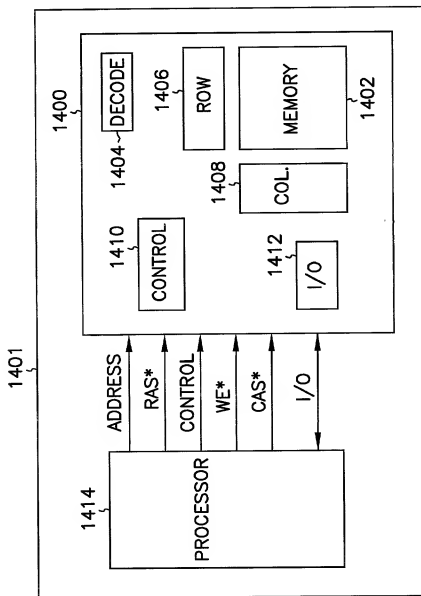


FIG. 14